

REMARKS

The Office Action dated December 11, 2007, has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

Claims 25-58, 71, 84-101, 110-119, and 121-131 are currently pending in the application, of which claims 35, 45, 92, 119, and 121-123 are independent claims. Claims 45-58, 71, 92-101, 110, 199, 121-123, and 126-131 have been amended to more particularly point out and distinctly claim the invention. No new matter has been added. Claims 25-58, 71, 84-101, 110-119, and 121-131 are respectfully submitted for consideration.

Claims 36-43, 46-53, 88-91, and 96-99 were indicated as containing allowable subject matter, but were objected to as being dependent on rejected base claims. Applicant thanks the Examiner for this indication of allowable subject matter. Nevertheless, Applicant respectfully requests withdrawal of the objection. As discussed in greater detail below, the base claims should also be allowed over the cited art.

Claims 35, 44, 45, 54-58, 71, 84-87, 92-95, 100, 101, 110, 119 and 121-131 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,822,363 of Le Roy ("Le Roy"). Applicant respectfully traverse this rejection.

Claim 35, upon which claims 36-44, 84-91, and 124-125 depend, is directed to a method including providing digital data to be transmitted to a remote station as a plurality of parallel bitstreams. The method also includes phase modulating the bitstreams with

respective orthogonal or substantially orthogonal spectrum spreading signals to produce a plurality of modulating signals. The method further includes phase modulating respective instances of a carrier with the modulating signals to produce a plurality to modulated carrier instances. The method additionally includes summing the modulated carrier instances and transmitting the result of the summation.

Claim 45, upon which claims 46-58, 71, and 126 depend, is directed to an apparatus including a source of digital data to be transmitted to a remote station as a plurality of parallel bitstreams. The apparatus also includes a first phase modulator configured to phase modulate the bitstreams with respective orthogonal or substantially orthogonal spectrum spreading signals to produce a plurality of modulating signals. The apparatus further includes a second phase modulator configured to phase modulate respective instances of a carrier with the modulating signals to produce a plurality to modulated carrier instances. The apparatus additionally includes a summer configured to sum the modulated carrier instances.

Claim 92, upon which claims 93-101, 110, and 128 depend, is directed to an apparatus including a receiver configured to receive a signal produced by a method including providing digital data to be transmitted to a remote station as a plurality of parallel bitstreams, phase modulating the bitstreams with respective orthogonal or substantially orthogonal spectrum spreading signals to produce a plurality of modulating signals, phase modulating respective instances of a carrier with the modulating signals to produce a plurality to modulated carrier instances, and summing the modulated carrier

instances and transmitting the result of the summation. The receiver includes a radio frequency processor configured to produce a baseband signal, including components corresponding to the modulating signals, from a received radio frequency signal. The receiver also includes a processor configured to process the baseband signal by processes configured to extract the data from each of the modulating signals.

Claim 119, upon which claim 130 depends, is directed to a mobile phone network including a base station in communicative relation to a plurality of mobile phones. The base station includes a receiver. The receiver includes a radio frequency processor configured to produce a baseband signals, including components corresponding to the modulating signals, from a received radio frequency signal. The receiver also includes a processor configured to process the baseband signal by processes configured to extract the data from each of the modulating signals. Each mobile phone includes a transmitter. The transmitter includes a source of digital data to be transmitted to a remote station as a plurality of parallel bitstreams. The transmitter also includes a first phase modulator configured to phase modulate the bitstreams with respective orthogonal or substantially orthogonal spectrum spreading signals to produce a plurality of modulating signals. The transmitter further includes a second phase modulator configured to phase modulate respective instances of a carrier with the modulating signals to produce a plurality to modulated carrier instances. The transmitter additionally includes a summer configured to sum the modulated carrier instances; wherein the mobile phones employ the same carrier frequency and spreading signals for communication with the base station, each

mobile phone applying the spreading signals in a time offset manner relative to the use of the spreading signals by each of the other mobile phones.

Claim 121, upon which claim 127 depends, is directed to an apparatus including digital data source means for providing digital data to be transmitted to a remote station as a plurality of parallel bitstreams. The apparatus also includes first means for phase modulating the bitstreams with respective orthogonal or substantially orthogonal spectrum spreading signals to produce a plurality of modulating signals. The apparatus further includes second means for phase modulating respective instances of a carrier with the modulating signals to produce a plurality to modulated carrier instances. The apparatus additionally includes summing means for summing the modulated carrier instances.

Claim 122, upon which claim 129 depends, is directed to an apparatus including receiver means for receiving a signal produced by a method including providing digital data to be transmitted to a remote station as a plurality of parallel bitstreams, phase modulating the bitstreams with respective orthogonal or substantially orthogonal spectrum spreading signals to produce a plurality of modulating signals, phase modulating respective instances of a carrier with the modulating signals to produce a plurality to modulated carrier instances, and summing the modulated carrier instances and transmitting the result of the summation. The receiver means includes radio frequency processing means for producing a baseband signal, including components corresponding to the modulating signals, from a received radio frequency signal. The receiver means

also includes processing means for processing the baseband signal by processes configured to extract the data from each of the modulating signals.

Claim 123, upon which claim 131 depends, is directed to a mobile phone network including a base station in communicative relation to a plurality of mobile phones, the base station including a receiver. The receiver includes radio frequency processing means for producing a baseband signals, including components corresponding to the modulating signals, from a received radio frequency signal. The receiver also includes processing means for processing the baseband signal by processes configured to extract the data from each of the modulating signals; and each mobile phone including a transmitter. The transmitter includes digital data source means for providing digital data to be transmitted to a remote station as a plurality of parallel bitstreams. The transmitter also includes first means for phase modulating the bitstreams with respective orthogonal or substantially orthogonal spectrum spreading signals to produce a plurality of modulating signals. The transmitter further includes second means for phase modulating respective instances of a carrier with the modulating signals to produce a plurality to modulated carrier instances. The transmitter further includes summing means for summing the modulated carrier instances; wherein the mobile phones employ the same carrier frequency and spreading signals for communication with the base station, each mobile phone applying the spreading signals in a time offset manner relative to the use of the spreading signals by each of the other mobile phones.

Applicant respectfully submits that Le Roy fails to disclose or suggest all of the elements of any of the presently pending claims.

Le Roy generally relates a transmission process having spectrum spread phase differential modulation and demodulation using orthogonal pseudorandom sequences.

Claim 35 recites, "providing digital data to be transmitted to a remote station as a plurality of parallel bitstreams." Le Roy does not disclose or suggest at least this feature. The Office Action apparently has addressed the feature "10" as corresponding to this aspect of the claim.

Feature 10 of Le Roy is a differential coder. As can be seen from Figure 5 of Le Roy, it has only a single bitstream entering the differential coder 10, and only one bitstream leaving the differential coder 10.

This is different from a "plurality of parallel bitstreams," as recited in claim 35, and as interpreted in light of the specification. For example, referring to Figure 4 of the present application, it can be seen that a bitstream can be converted into a plurality of parallel bitstreams, using a serial-to-parallel converter. Then, as shown in Figure 5, those plurality of parallel bitstreams can be provided for processing.

Furthermore, as stated in the application, at page 2, lines 27-31, "The present invention may be used to send two or more signals in parallel. For instance a video signal could be sen[t] four bits at a time using four spreading signals and an accompanying audio signal could be sent with another spreading signal. Preferably,

however said bitstreams comprise bits of a single digital signal such that groups of bits of said single digital signal are transmitted in parallel.”

The Office Action does not explicitly address this feature of the claim, simply stating that Le Roy “teaches ... providing digital data 10” and “phase modulating bitstreams” Upon inspection of Le Roy, however, it turns out that only a single bitstream exists in Le Roy prior to operations of the first and second generators 30₁ and 30₂, which are the features that the Office Action relies on for the phase modulating aspects of the claims.

Accordingly, it is respectfully submitted that Le Roy does not have any feature corresponding to the claimed feature, “providing digital data to be transmitted to a remote station as a plurality of parallel bitstreams,” as recited in claim 35.

Applicant recognizes that the claim must be interpreted as broadly as reasonably possible, but insists that this broad, reasonable interpretation must be made in light of the specification. In light of the specification, it is clear that a single bitstream is not “a plurality of parallel bitstreams.” Thus, if a single bitstream is initially input (as in some embodiments of the present invention), then that single bitstream should be converted to a plurality of parallel bitstreams using, for example, a serial to parallel converter. There is no corresponding disclosure in Le Roy.

In Le Roy, a single bitstream is simply fed to two multipliers (32₁ and 32₂). This redundancy is important to Le Roy in order to achieve Le Roy’s objective of “improv[e] the quality of the output signal of the demodulator (signal $m(t)$) and therefore the

transmission quality.” Thus, not only are the claims novel with respect to Le Roy, they are non-obvious as well.

MPEP 2143.01(V) states “THE PROPOSED MODIFICATION CANNOT RENDER THE PRIOR ART UNSATISFACTORY FOR ITS INTENDED PURPOSE,” (Capital letters in original.) and explains that “If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification.” Moreover, MPEP 2145(III) states that “the claimed combination cannot change the principle of operation of the primary reference or render the reference inoperable for its intended purpose.” The necessary modification would render the primary reference inoperable for its intended purpose by removing redundancy necessary to the operation of Le Roy to accomplish its purpose of enhanced quality.

Thus, it is respectfully submitted that the rejection of claim 35 should be withdrawn, and timely withdrawal of the rejection of claim 35 is respectfully requested. Independent claims 45, 92, 119 and 121-123 each have their own respective scope. Nevertheless, claims 45, 92, 119 and 121-123 were not separately rejected, and recite at least some similar features. Accordingly, it is respectfully submitted that each of claims 45, 92, 119 and 121-123 recites subject that is both novel and non-obvious with respect to Le Roy, and it is respectfully requested that the rejection of claims 45, 92, 119 and 121-123 be withdrawn.

Dependent claims 44, 54-58, 71, 84-87, 93-95, 100, 101, 110, 119 and 124-131 depend respectively from, and further limit, claims 35, 45, 92, 119, and 121-123. Thus, each of claims 44, 54-58, 71, 84-87, 93-95, 100, 101, 110, 119 and 124-131 recites subject matter that is neither disclosed nor suggested in the cited art. It is, therefore, respectfully requested that the rejection of each of claims 44, 54-58, 71, 84-87, 93-95, 100, 101, 110, 119 and 124-131 be withdrawn.

Furthermore, claims 124-131 each recite that “the spreading signals comprise a common finite spreading sequence.” Le Roy fails to disclose or suggest at least this feature of the claims. The Office Action rejected claims 124-131 on the basis of Le Roy, but did not provide any explanation of how Le Roy allegedly discloses such features.

Accordingly, either the Office Action unintentionally listed them as rejected (when they ought to have been listed as allowable), or the Office Action is incomplete, since it simply fails to address those features of the claims. Accordingly, it is respectfully that, for this additional reason, the rejection of claims 124-131 be withdrawn, and the allowability of claims 124-131 be noted.

For the reasons set forth above, it is respectfully submitted that each of claims 25-58, 71, 84-101, 110-119, and 121-131 recites subject matter that is neither disclosed nor suggested in the cited art. It is, therefore, respectfully suggested that each of claims 25-58, 71, 84-101, 110-119, and 121-131 be allowed, and that this application be passed to issuance.

If, for any reason, the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, Applicant's undersigned representative at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, Applicant respectfully petitions for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Peter Flanagan", written over a horizontal line.

Peter Flanagan
Registration No. 58,178

Customer No. 32294
SQUIRE, SANDERS & DEMPSEY LLP
14TH Floor
8000 Towers Crescent Drive
Tysons Corner, Virginia 22182-2700
Telephone: 703-720-7800
Fax: 703-720-7802

PCF/cqc